SERVICE MANUAL 105B

marantz

model 105B

Fm / Am Stereophonic Tuner

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INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 105B Stereophonic Tuner.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the tuner.

The part lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can be usually be obtained through local suppliers.

The Model 105B is a tuner version of the Marantz's Model 2015 Tuner/Amplifier and almost the same circuitry as used in the Model 2015 is employed except the audio Amplifier, and power supply circuit.

1. AM Tuner

All components except ferrite bar antenna are mounted on a printed circuit board P100.

The AM signals induced in a ferrite bar antenna are applied to the base of converter transistor H113 through a capacitor of C171, while the local oscillator voltage is injected to the emitter of H113 through a capacitor C172. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer L116 consisting of one ceramic filter and two tuned circuits.

The output of L116 is led to the transistor H104 which in turn apply its output to the transistor of next stage H105. The fully amplified IF output is then applied to the diode H123 to detect audible signal through the detector transformer L117. The detected audio signal is filtered and the final audio output is obtained from pin terminal J118 and applied: to the output jacks through the function switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H104 through the resistor R185. A part of IF signal output is also applied to the diode H124 through a capacitor C180 and rectified to obtain DC current for energizing the AM signal strength meter M001.

1.1 Suggestions for AM Tuner trouble shooting

Check for broken AM bar antenna, next try to tune station by rotating fly-wheel tuning knob slowly and observe the AM signal strength meter whether it deflects or not. If the signal strength meter gives a deflection at several frequencies received, no failure may exist in the stages at least preceding final IF transformer L117. Next connect a oscilloscope to the pin terminal J118 and check for audio signals with the tuning meter deflected. If the signal strength meter does not deflect, check the local oscillator circuit. Normal oscillating voltage at the hot end of the oscillator tuning capacitor is about 2 or 3 volts, varying with tuning capacitor position. When measuring oscillating voltage use a RF VTVM, no circuit tester gives correct indication. If the local oscillator voltage is normal, check all voltage distribution in the AM circuits by using a DC VTVM and compare the measured values with those given in the schematic diagram.

2. FM Tuner

All components are mounted on a printed circuit board P100.

FM signals induced by a FM antenna are led to FM antenna coil L101.

These signals are then applied to the FET RF amplifier which in turn applies its output to the next transistor mixer H102 through a high Q tuned circuit.

The mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the base of mixer transistor, the injection voltage is about 40mV.

The 10.7 MHz front end output is led to the next IF section. The IF section consists of five stage of IF amplifier and one stage of sub IF amplifier. Two pieces of ceramic filters are also used to obtain high selectivity, a pair of symmetrical diode limiters are also employed for the best limiting characteristics, improved capture ratio and good AM suppression. A part of IF amplifier H105 output is rectified by the diode H115, H116 and its DC output is fed back to the gate of FET RF amplifier to decrease the gain with increased signal strength.

2.1 Muting and Auto-Stereo Switching Circuits

The muting circuit consisting of all solid-state electrical switching has been incorporated in the Model 105B.

The DC voltage obtained by rectifing the sub IF output signal from the H109 is applied to the base of H110 and turns on it, if the sub IF output is greater than predetermined level (muting threshold level).

When H110 turns on, the muting switch transistor H111 is turned on, thus decreasing the emitter collector resistance to near zero ohm and allowing emitter current path to the Final IF amplifier H108.

When the input signal is lower than the predetermined level, the DC output obtained is small and can not turn on the H110, thus the H110 keeps its turn off state and this makes the switch transistor keep H111 turn off, then no emitter current is supplied to the H108 and signals below the threshold level are muted out.

The muting threshold level can be varied by adjusting the trimming resistor R153.

The DC voltage obtained is also used to make the Auto-Stereo switching transistor H112 turn on and off.

2.2 MPX Stereo Decoding Circuit

A Non-equalized audio signal from the FM detector is applied through the phase adjuster network of C148 and R161 to input terminal pin ① on the MPX decoder IC H114. The MPX decoder IC consists of a stereo decoder and postamplifier for the output. The right and left channel signals decoded by the stereo decoder H114, appear at pin ⑩ (right channel) and pin ⑪ (left channel), respectively. These signals are passed through the low-pass filters and de-emphasis networks to eliminate undesirable residual switching signals and are then delivered to postamplifier input pin ⑤ (right channel) and pin ⑦ (left channel), respectively. The signals amplified in the postamplifiers to the required level (approximately 10 dB) are delivered to pin ⑥ (right channel) and pin ⑧ (left channel), and are then passed through C169 and C168 to pin terminals J114 and J115, hence, through function switches to the "OUTPUT" terminal. Pin ⑮ on the MPX IC H114 is connected through R163 to the collector of the autostereo switch transistor H112, which turns on or off according to the incoming FM signal strength, thereby automatically switching between the stereophonic and monaural operations. The H112 turns on or off in accordance with whether the FM signal strength is more or less than approximately 25μV.

2.3 Suggestion for Trouble Shooting of FM Tuner

2.3.1 Symptom: No FM Reception

First turn on the power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM TUNING meter. If the TUNING meter deflect at several frequencies received, the tuner circuits preceding the discriminator circuit may have no failure. When no reading is obtained in the meter, check FM local oscillator circuit, using a RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, next check all voltage distribution in the FM Front End and IF amplifier unit and compare them with those shown in the circuit diagram. When TUNING meter deflects but no sound is obtained, check audio circuits, using high sensitive oscilloscope.

2.3.2 Symptom: No Stereo Separation

First check the "MONO" switch is in normal out position. Connect a FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check the stereo beacon is turned on or not. If not turned on, check for 19 KHz pilot signal and 38 KHz switching signal, using an oscilloscope.

3. AM Alignment Procedure

3.1 AM IF Alignment

1. Connect a sweep generator to the test point Ⓐ or J107 and an alignment scope to the test point Ⓑ.
2. Rotate each core of IF transformer L116 and L117 for maximum height and flat top symmetrical response.

3.2 AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525 KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L115 for maximum audio output.
2. Set the signal generator to 1650 KHz. Place the tuning pointer in the high frequency end and adjust the oscillator trimmer on the oscillator tuning capacitor (CA-2) for maximum audio output.
3. Repeat the step 1 and 2 until no further adjustment is necessary.
4. Set the generator to 600 KHz and tune the receiver to the same frequency and adjust a slug core of AM ferrite rod antenna for maximum output.
5. Set the generator to 1400 KHz and tune the receiver to the same frequency and adjust the trimming capacitors of Antenna (CA-1) for maximum output.
6. Repeat the step 4 and 5 until no further adjustment is necessary.

Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

4. FM Alignment Procedure

1. Connect a FM signal generator to the FM antenna terminals and a oscilloscope and an audio distortion analyzer to the tape output jacks on the rear panel.
2. Set the FM SG to 87.5 MHz and provide about 3 to 5 μV. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L103 to obtain maximum audio output.
3. Set the FM SG to 108.5 MHz and provide about 3 to 5 μV output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C187 for Maximum output.
4. Repeat the step 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90 MHz and tune the receiver to the same frequency. Decrease signal generator output until the audio output level decreases with the decreasing generator output. Adjust the antenna coil L101, RF coil L102 and IF transformer L105 for minimum audio distortion.
6. Set the FM SG to 106 MHz and tune the receiver to the same frequency. Adjust the trimming capacitor CF-1, CF-2 for minimum distortion.
7. Repeat the step 5 and 6 until no further adjustment is necessary.
8. Connect a DC VTVM with $\pm$0.5 volt range selected to the test point Ⓔ (J120) and adjust the secondary core (upper) of discriminator transformer L107 so that no voltage reading is obtained on the VTVM at no signal.

   Next set the FM SG to 98 MHz and increase the output level to 1 KμV, then tune the receiver to the same frequency so that no deflection is obtained on the VTVM.

   Adjust primary core (bottom) of L107 for minimum distortion, and adjust the L108 for the maximum reading on the VTVM connected to the J109.

4.1 STEREO Separation Alignment

1. Set the FM SG to provide 1 KμV at 98 MHz.
   Tune the receiver to the same frequency perfectely (so that the VTVM connected to the test point Ⓔ gives no reading).
2. Modulate the FM SG with stereo composite signal consisting of subchanged signal only (of course a pilot signal must be included).
   Adjust the core of L110 for maximum audio output, then, modulate the FM SG with a stereo composite signal consisting of L or R channel only, and adjust the trimming resistor R161 for maximum and equal separation in both channels.

4.2 Muting Circuit Alignment

1. Set the FM SG output to provide 25 μV (IHF) at 98 MHz and tune the receiver to the same frequency.
   Adjust the trimming resistor R153 for the threshold level of 25 μV (during this adjustment turn the MUTING pushswitch "on").

5. Test Equipment Required for Servicing

Table 1 lists the test equipment required for servicing the Model 105B Tuner.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Used with AM Signal generator
FM Signal Generator	Less than 0.3% distortion	Signal source for FM alignment
Stereo Modulator	Less than 0.3% distortion	Stereo separation alignment and trouble shooting
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required	Sinewave and squarewaves signal source
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers	Waveform analysis and Trouble Shooting, and ASO alignment
VTVM	With AC, DC, RF range	Voltage measurements
Circuit Tester		Trouble Shooting

Table 1. Test Equipment Required for Servicing

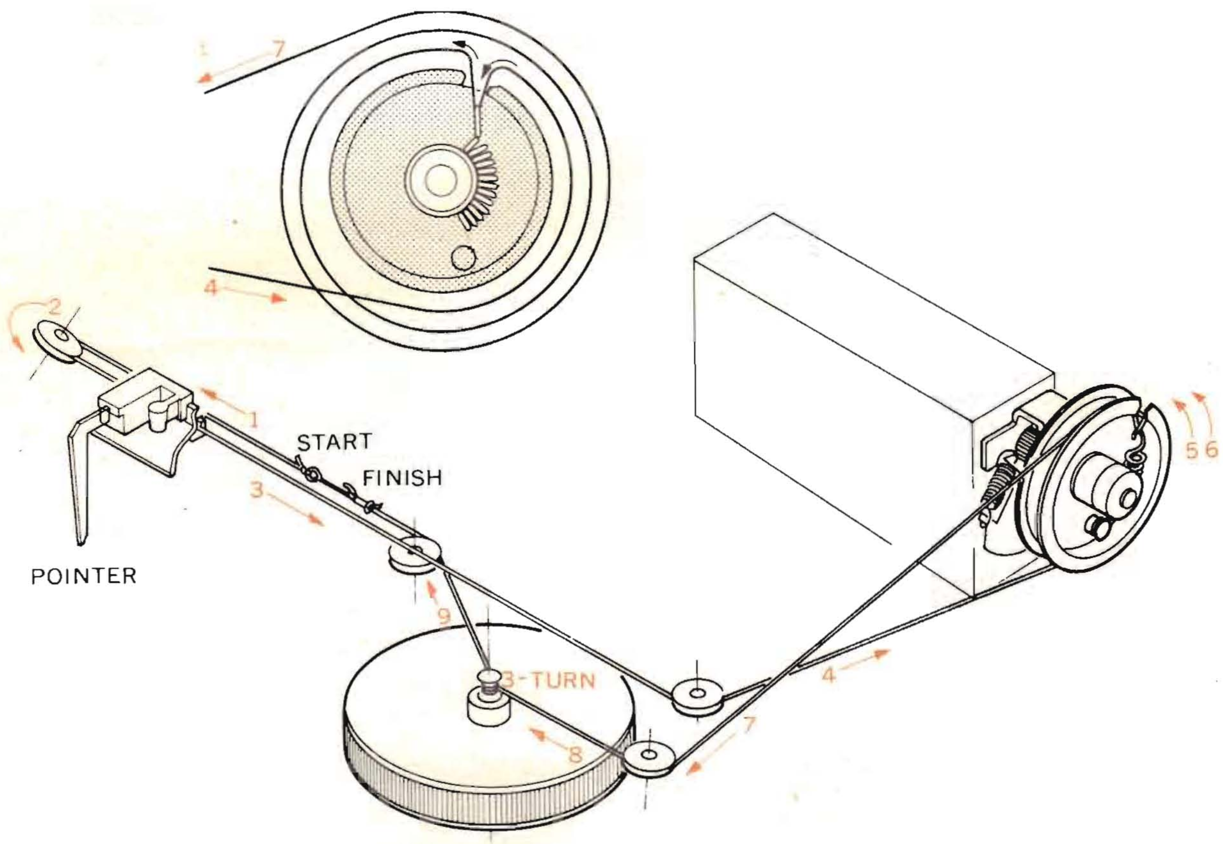


Figure 1. Dial Stringing



Figure 2. Front Panel Adjustments and Component Locations

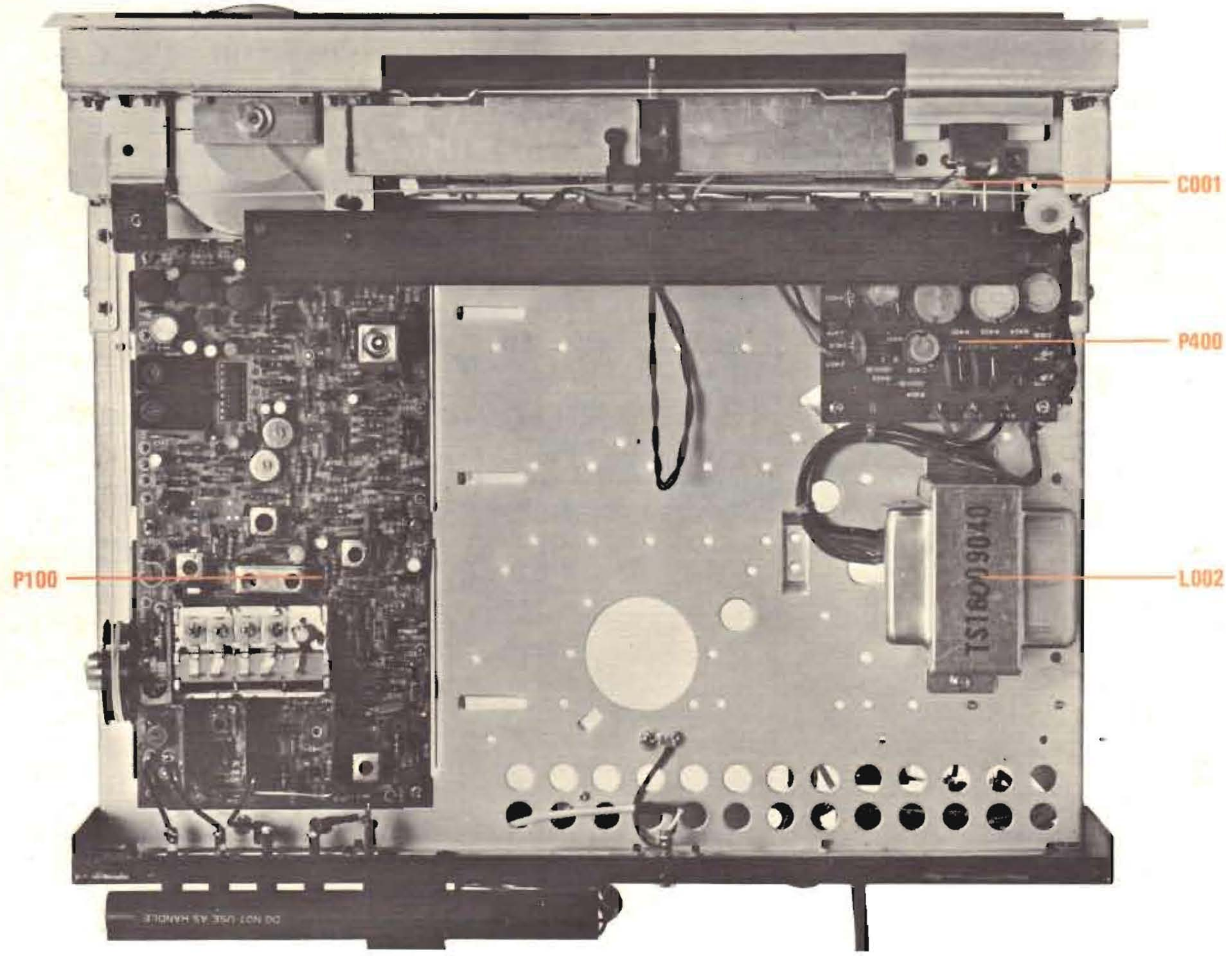


Figure 3. Main Chassis Component Locations (Top View)

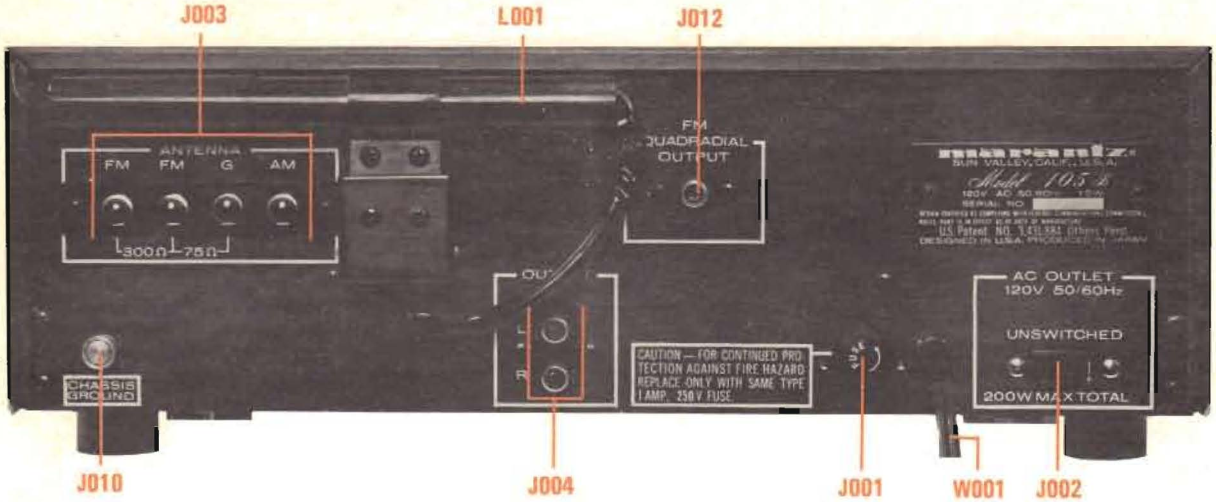


Figure 4. Rear Panel Adjustment and Component Locations

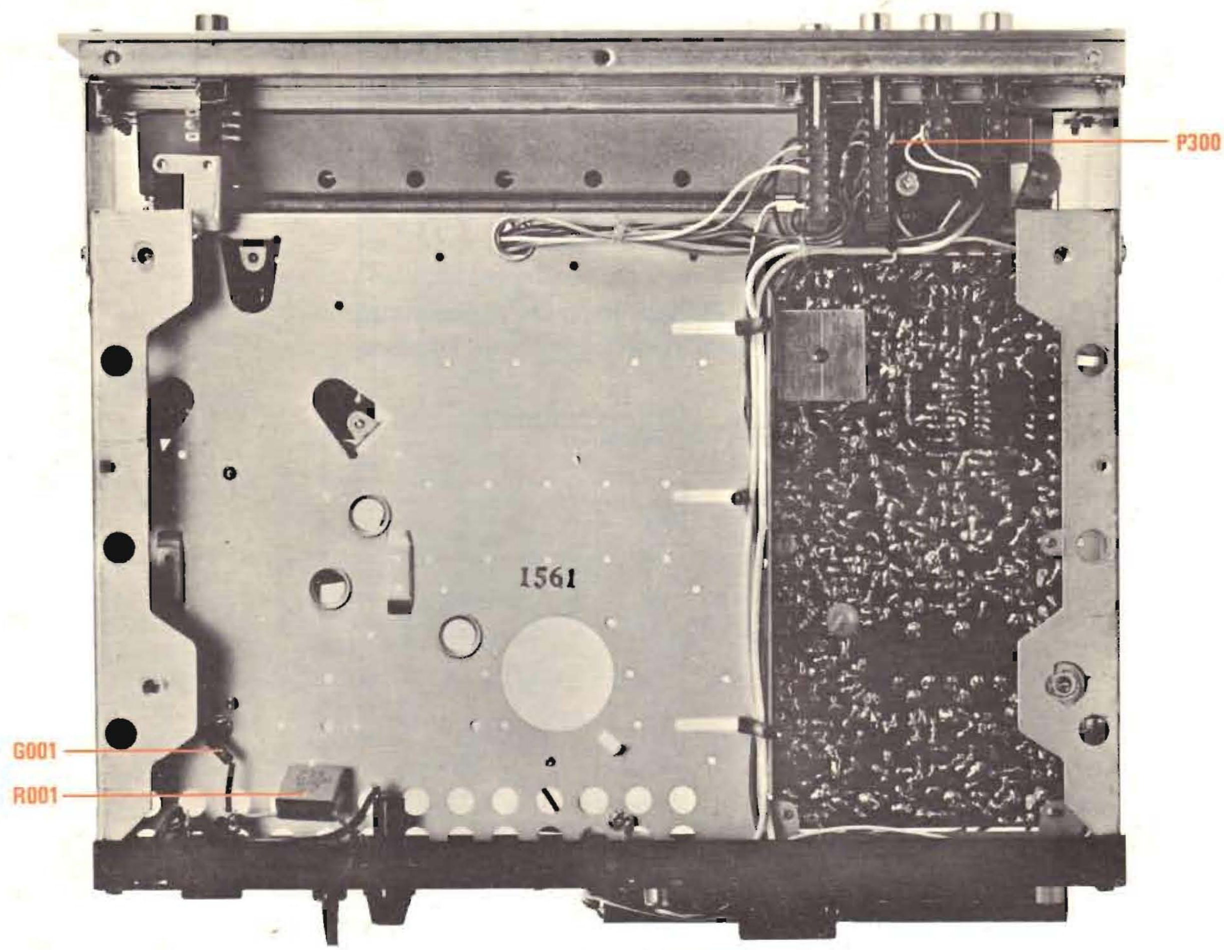


Figure 5. Main Chassis Component Locations (Bottom View)

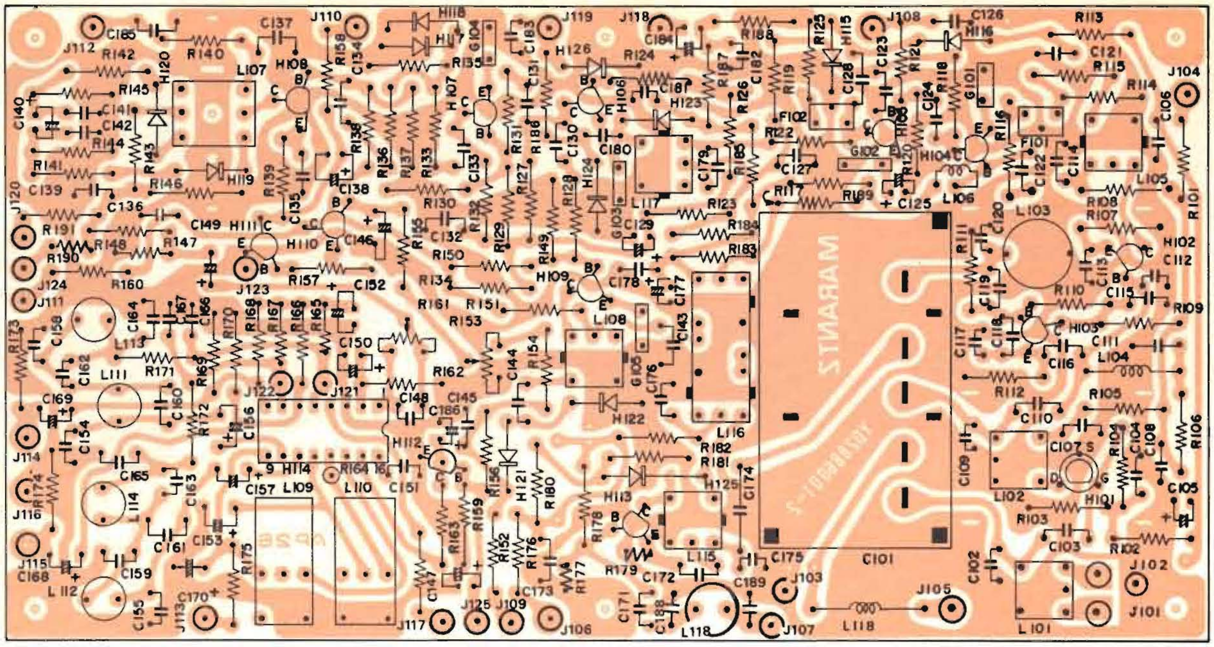


Figure 6. FM/AM Tuner Assembly P100 Component Locations

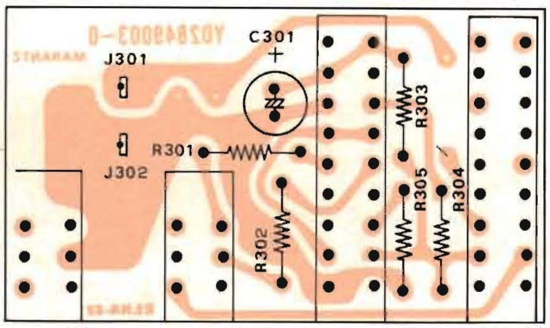


Figure 7. FM, AM, Mono and Muting Switch Assembly P300 Component Locations

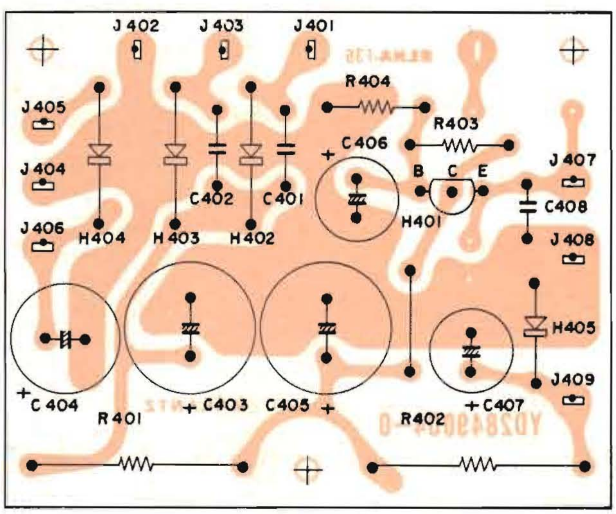


Figure 8. Power Supply Assembly P400 Component Locations

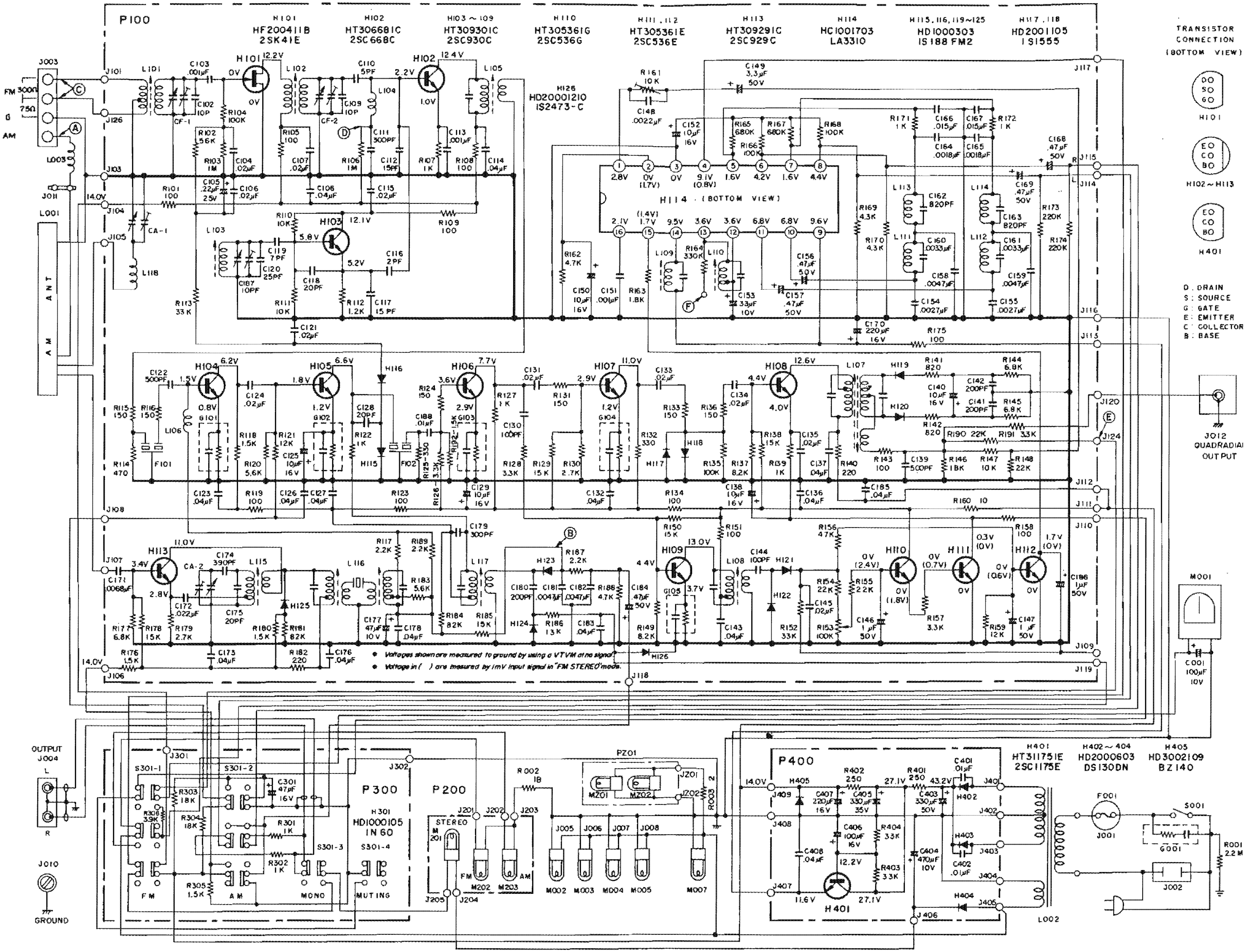
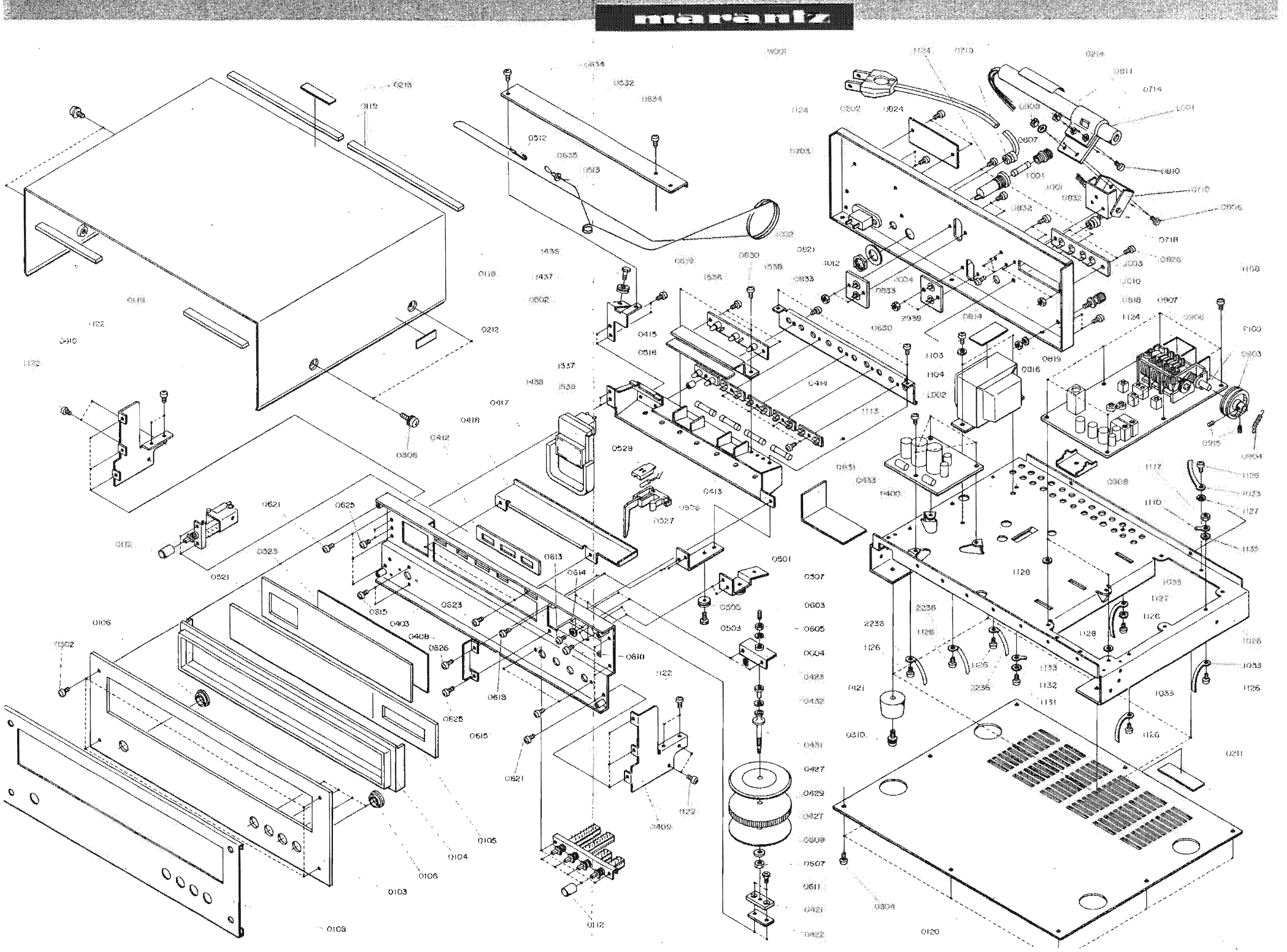


Figure 9. Schematic Diagram



0119
0212
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0604
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0907
0903
0915
0904
0310
0121
0211
0120
0714
0710
0718
0810
0906
1103
1104
1128
1126
1127
1131
1132
1133

PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
A	284906340	Front Panel Assembly
0103	284906301	Escutcheon
0104	282740101	Frame
0105	282715801	Window
0106	281825905	Bush x 5
0108	284905301	Cover
B	285027340	Fly Wheel Assembly
0427	257706302	Escutcheon x 2
0429	257727301	Fly Wheel
0431	285011201	Shaft
0607	53110603E	Hexagon Nut
0609	54020601E	Flat Washer P
C	120200640	String Assembly
0512	120225801	Hook
0513	72080802A	String
D	285010341	Pointer Assembly
0526	281810301	Pointer
0527	285010301	Pointer
0528	281805301	Cover
M007	IN1008030	Lamp
E	284916040	Rear Panel Assembly
0703	284916001	Bracket
0821	55060365S	T.R. Rivet x 2
J002	YJ0400018	Jack
P100	YD2886001	P.W. Board, Tuner
	YD2849101	P.W. Board Assembly
		RESISTORS
		All resistors are ±5% and ¼W, unless otherwise indicated.
R101	RT0510114	100Ω
R102	RT0556314	56KΩ
R103	RT0510514	1MΩ
R104	RT0510414	100KΩ
R105	RT0510114	100Ω
R106	RT0510514	1MΩ
R107	RT0510214	1KΩ
R108	RT0510114	100Ω
R109	RT0510114	100Ω
R110	RT0510314	10KΩ
R111	RT0510314	10KΩ
R112	RT0512214	1.2KΩ
R113	RT0533314	33KΩ
R114	RT0547114	470Ω
R115	RT0515114	150Ω
R116	RT0515114	150Ω
R117	RT0522214	2.2KΩ
R118	RT0515214	1.5KΩ
R119	RT0510114	100Ω
R120	RT0556214	5.6KΩ
R121	RT0512314	12KΩ
R122	RT0510214	1KΩ
R123	RT0510114	100Ω
R124	RT0515114	150Ω
R125	RT0533114	330Ω

REF. DESIG.	PART NO.	DESCRIPTION
R126	RT0533214	3.3KΩ
R127	RT0510214	1KΩ
R128	RT0533214	3.3KΩ
R129	RT0515314	15KΩ
R130	RT0527214	2.7KΩ
R131	RT0515114	150Ω
R132	RT0533114	330Ω
R133	RT0515114	150Ω
R134	RT0510114	100Ω
R135	RT0510414	100KΩ
R136	RT0515114	150Ω
R137	RT0582214	8.2KΩ
R138	RT0515314	15KΩ
R139	RT0510214	1KΩ
R140	RT0522114	220Ω
R141	RT0582114	820Ω
R142	RT0582114	820Ω
R143	RT0510114	100Ω
R144	RT0568214	6.8KΩ
R145	RT0568214	6.8KΩ
R146	RT0518314	18KΩ
R147	RT0510314	10KΩ
R148	RT0522314	22KΩ
R149	RT0582214	8.2KΩ
R150	RT0515314	15KΩ
R151	RT0510114	100Ω
R152	RT0533314	33KΩ
R153	RA0104015	Trimming, 100KΩ (B)
R154	RT0522314	22KΩ
R155	RT0522314	22KΩ
R156	RT0547314	47KΩ
R157	RT0533214	3.3KΩ
R158	RT0510114	100Ω
R159	RT0518314	18KΩ
R160	RT0510014	10Ω
R161	RA0103020	Trimming, 10KΩ (B)
R162	RT0547214	4.7KΩ
R163	RT0515214	1.5KΩ
R164	RC1033412	330KΩ ± 10%, ½W
R165	RT0568414	680KΩ
R166	RT0510414	100KΩ
R167	RT0568414	680KΩ
R168	RT0510414	100KΩ
R169	RT0543214	4.3KΩ
R170	RT0543214	4.3KΩ
R171	RT0510214	1KΩ
R172	RT0510214	1KΩ
R173	RT0522414	220KΩ
R174	RT0522414	220KΩ
R175	RT0510114	100Ω
R176	RT0515214	1.5KΩ
R177	RT0568214	6.8KΩ
R178	RT0515314	15KΩ
R179	RT0527214	2.7KΩ
R180	RT0515214	1.5KΩ
R181	RT0582314	82KΩ
R182	RT0522114	220Ω
R183	RT0556214	5.6KΩ
R184	RT0582314	82KΩ
R185	RT0515314	15KΩ
R186	RT0513314	13KΩ
R187	RT0522214	2.2KΩ

REF. DESIG.	PART NO.	DESCRIPTION
R188	RT0547214	4.7KΩ
R189	RT0522214	2.2KΩ
R190	RT0522314	22KΩ
R191	RT0533214	3.3KΩ
R192	RT0515214	1.5KΩ
R193	RT0527414	270KΩ
R194	RT0510414	100KΩ
		CAPACITORS
C101	CA3240007	Variable, FM-3, AM-2, Gang
C102	DD1210001	Ceramic, 10PF ±10%
C103	DK1710201	Ceramic, 0.001μF ± 20%
C104	DK1820302	Ceramic, 0.02μF +100%, -0%
C105	EM2240251	Electroly, 0.22μF, 25V
C106	DK1820302	Ceramic, 0.02μF +100%, -0%
C107	DK1820302	Ceramic, 0.02μF +100%, -0%
C108	DK1840302	Ceramic, 0.04μF +80%, -20%
C109	DD1210001	Ceramic, 10PF ± 10%
C110	DD1105001	Ceramic, 5PF ± 0.5PF
C111	DD1530101	Ceramic, 300PF ± 5%
C112	DD1615003	Ceramic, 15PF ± 10%
C113	DK1710201	Ceramic, 0.001μF ±20%
C114	DK1840302	Ceramic, 0.04μF +80%, -20%
C115	DK1820302	Ceramic, 0.02μF +100%, -0%
C116	DD1102004	Ceramic, 2PF ± 0.5PF
C117	DD1615003	Ceramic, 15PF ± 10%
C118	DD1520001	Ceramic, 20PF ± 5%
C119	DD1207003	Ceramic, 7PF ± 1PF
C120	DD1525003	Ceramic, 25PF ± 5%
C121	DK1820302	Ceramic, 0.02μF +100%, -0%
C122	DD1650101	Ceramic, 500PF ± 10%
C123	DK1840302	Ceramic, 0.04μF +80%, -20%
C124	DK1820302	Ceramic, 0.02μF +100%, -0%
C125	EA1060169	Electroly, 10μF, 16V
C126	DK1840302	Ceramic, 0.04μF +80%, -20%
C127	DK1840302	Ceramic, 0.04μF +80%, -20%
C128	DD1620001	Ceramic, 20PF ± 10%
C129	EA1060169	Electroly, 10μF, 16V
C130	DD1610101	Ceramic, 10PF ± 10%
C131	DK1820302	Ceramic, 0.02μF +100%, -0%
C132	DK1840302	Ceramic, 0.04μF +80%, -20%
C133	DK1820302	Ceramic, 0.02μF +100%, -0%
C134	DK1820302	Ceramic, 0.02μF +100%, -0%
C135	DK1820302	Ceramic, 0.02μF +100%, -0%
C136	DK1840302	Ceramic, 0.04μF +80%, -20%
C137	DK1840302	Ceramic, 0.04μF +80%, -20%
C138	EA1060169	Electroly, 10μF, 16V
C139	DD1650101	Ceramic, 500PF ± 10%
C140	EA1060169	Electroly, 10μF, 16V
C141	DD1620101	Ceramic, 200PF ± 10%
C142	DD1620101	Ceramic, 200PF ± 10%
C143	DK1840302	Ceramic, 0.04μF +80%, -20%
C144	DD1610101	Ceramic, 100PF ± 10%
C145	DK1820302	Ceramic, 0.02μF +100%, -0%
C146	EA1050509	Electroly, 1μF, 50V
C147	EA1050509	Electroly, 1μF, 50V
C148	DF1722201	Film, 0.0022μF ± 20%
C149	EA3350509	Electroly, 3.3μF, 50V
C150	EA1060169	Electroly, 10μF, 16V
C151	DF1610201	Film, 0.001μF ± 10%
C152	EA1060169	Electroly, 10μF, 16V
C153	EA3360109	Electroly, 33μF, 10V
C154	DF1627201	Film, 0.0027μF ± 10%
C155	DF1627201	Film, 0.0027μF ± 10%
C156	EA4740501	Electroly, 0.47μF, 50V
C157	EA4740501	Electroly, 0.47μF, 50V
C158	DF1647201	Film, 0.0047μF ± 10%
C159	DF1647201	Film, 0.0047μF ± 10%
C160	DF1533205	Film, 0.0033μF ± 5%
C161	DF1533205	Film, 0.0033μF ± 5%
C162	DF5582101	Film, 820PF ± 5%
C163	DF5582101	Film, 820PF ± 5%
C164	DF1618205	Film, 0.0018μF ± 10%
C165	DF1618205	Film, 0.0018μF ± 10%
C166	DF1615301	Film, 0.015μF ± 10%
C167	DF1615301	Film, 0.015μF ± 10%
C168	EA4740501	Electroly, 0.47μF, 50V
C169	EA4740501	Electroly, 0.47μF, 50V
C170	EA2270169	Electroly, 220μF, 16V
C171	DF1768201	Film, 0.0068μF ± 20%
C172	DF1722301	Film, 0.022μF ± 20%
C173	DF1740301.	Film, 0.04μF ± 20%
C174	DF6539101	Film, 390PF ± 5%
C175	DD1620001	Ceramic, 20PF ± 10%
C176	DF1740301	Film, 0.04μF ± 20%
C177	EA4760109	Electroly, 47μF, 10V
C178	DK1840302	Ceramic, 0.04μF +80%, -20%
C179	DD1530101	Ceramic, 300PF ± 5%
C180	DD1620101	Ceramic, 200PF ± 10%
C181	DF1647201	Film, 0.0047μF ± 10%
C182	DF1647201	Film, 0.0047μF ± 10%
C183	DK1840302	Ceramic, 0.04μF +80%, -20%
C184	EA4740501	Electroly, 0.47μF, 50V
C185	DK1840302	Ceramic, 0.04μF +80%, -20%
C186	EA1050509	Electroly, 1μF, 50V
C187	CT1100008	Trimming, 10PF, NPO
C188	DK1710301	Ceramic, 0.01μF ± 20%
		SEMICONDUCTORS
H101	HF200411B	F.E.T., 2SK41 (E)
H102	HT306681C	Transistor, 2SC668 (C)
H103	HT309301C	Transistor, 2SC930 (C)
H104	HT309301C	Transistor, 2SC930 (C)
H105	HT309301C	Transistor, 2SC930 (C)
H106	HT309301C	Transistor, 2SC930 (C)
H107	HT309301C	Transistor, 2SC930 (C)
H108	HT309301C	Transistor, 2SC930 (C)
H109	HT309301C	Transistor, 2SC930 (C)
H110	HT305361G	Transistor, 2SC536 (G)
H111	HT305361E	Transistor, 2SC536 (E)
H112	HT305361E	Transistor, 2SC536 (E)
H113	HT309291C	Transistor, 2SC929 (C)
H114	HC1001703	I.C., LA3310
H115	HD1000303	Diode, 1S188FM2
H116	HD1000303	Diode, 1S188FM2
H117	HD2001105	Diode, 1S1555
H118	HD2001105	Diode, 1S1555
H119	HD1000303	Diode, 1S188FM2
H120	HD1000303	Diode, 1S188FM2
H121	HD1000303	Diode, 1S188FM2
H122	HD1000303	Diode, 1S188FM2
H123	HD1000303	Diode, 1S188FM2
H124	HD1000303	Diode, 1S188FM2
H125	HD1000303	Diode, 1S188FM2
H126	HD2000121	Diode, 1S2473-C

REF. DESIG.	PART NO.	DESCRIPTION
		MISCELLANEOUS
J101	YP1000113	Plug
J103 ≀ J126	YP1000113	Plug
0906	282110901	Shield
0907	288610904	Shield
0908	285010902	Shield
1110	62031650W	Lug
P400	YD2849004	P.W. Board, Power
	ZZ2849004	P.W. Board Assembly
		RESISTORS
R401	GJ1025102	250Ω ±10%, 2W
R402	GJ1025102	250Ω ±10%, 2W
R403	RT0533314	33KΩ ±5%, ¼W
R404	RT0533314	33KΩ± 5%, ¼W
		CAPACITORS
C401	DK1810351	Ceramic, 0.01μF +100%, -0%, 500V
C402	DK1810351	Ceramic, 0.01μF +100%, -0%, 500V
C403	EA3370509	Electroly, 330μF, 50V
C404	EA4770109	Electroly, 470μF, 10V
C405	EA3370359	Electroly, 330μF, 35V
C406	EA1070160	Electroly, 100μF, 16V
C407	EA2270169	Electroly, 220μF, 16V
C408	DK1840301	Ceramic, 0.04μF +100%, -0%
		SEMICONDUCTORS
H401	HT311751E	Transistor, 2SC1175 (E)
H402	HD2001003	Diode, DS130 (YD)
H403	HD2001003	Diode, DS130 (YD)
H404	HD2001003	Diode, DS130 (YD)
H405	HD3002109	Diode, BZ140
		MISCELLANEOUS
J401 ≀ J409	YP1000099	Plug
0403	282716050	Bracket K
0408	285020101	Partitioner
0409	285016003	Bracket
0410	285016004	Bracket
0412	285012201	Sticker
0421	257710602	Bearing
0422	141511801	Spacer
0507	285016051	Bracket K
0611	51040306A	F.H.M. Screw x 2
0615	51100306A	B.H.M. Screw x 4
0618	51100306A	B.H.M. Screw x 4
0621	51100306A	B.H.M. Screw x 6
0623	51100306A	B.H.M. Screw x 2
0625	51100306A	B.H.M. Screw x 3
0626	51100306A	B.H.M. Screw

REF. DESIG.	PART NO.	DESCRIPTION
P300	YD2849003	P.W. Board
	ZZ2849703	P.W. Board Assembly
R301	RT0510214	Resistor, 1KΩ ±5%, ¼W
R302	RT0510214	Resistor, 1KΩ ±5%, ¼W
R303	RT0518314	Resistor, 18KΩ ±5%, ¼W
R304	RT0518314	Resistor, 18KΩ ±5%, ¼W
R305	GT0515212	Resistor, 1.5KΩ ±5%, ½W
R306	RT0539214	Resistor, 3.9KΩ ±5%, ¼W
C301	EA4760169	Electroly Cap., 47μF, 16V
S301	SP0604003	Push Switch, Band Selector
J301	YP1000099	Plug
J302	YP1000099	Plug
S001	SP0301001	Push Switch
M001	IM1104208	DC Meter, Signal
C001	EA1070109	Electroly Cap., 100μF, 10V
0417	285011801	Spacer
1438	285012003	Insulator
1439	289105305	Cover
0501	285016009	Bracket
0503	263711203	Shaft
0505	257726201	Pulley
0502	285016008	Bracket
1436	263711203	Shaft
1437	257726201	Pulley
0414	281827101	Holder
0631	51570306B	P.H. Tapt Screw x 4
J005	YJ0800013	Socket
J006	YJ0800013	Socket
J007	YJ0800013	Socket
J008	YJ0800013	Socket
M002	IN1008007	Lamp
M003	IN1008007	Lamp
M004	IN1008007	Lamp
M005	IN1008007	Lamp
1537	289110106	Support
1538	51570315B	P.H. Tapt Screw
R003	RC1002012	Resistor, 2Ω ± 10%, ½W
0415	282716003	Bracket
0518	282710701	Sheet
1536	51570306B	P.H. Tapt Screw x 2
P200	YD2849002	P.W. Board
	ZZ2849002	P.W. Board Assembly
M201	IN1006301	Lamp, 6.3V, 40mA
M202	IN1006301	Lamp, 6.3V, 40mA
M203	IN1006301	Lamp, 6.3V, 40mA
J201 ≀ J205	YP1000099	Plug

REF. DESIG.	PART NO.	DESCRIPTION
R002	RC1018012	Resistor, 18Ω ± 10%, ½W
0413	282727401	Reflector
0619	51570306B	P.H. Tapt Screw x 2
0630	51570305B	P.H. Tapt Screw x 4
0418	282705101	Guide
0718	145525903	Bush x 2
0814	51100306S	B.H.M. Screw x 3
0819	54050400R	T.L. Washer OR
0826	51100308S	B.H.M. Screw x 2
0827	53110303E	Hexagon Nut x 2
0832	51100308S	B.H.M. Screw x 4
0833	53110303E	Hexagon Nut x 4
J001	YJ0800012	Socket, Fuse Holder
J003	YT0104004	Terminal, Ant.
J004	YT0202007	Terminal, Output
J010	YT0101003	Terminal, Ground
W001	YC0240010	AC Cord
G001	BF1040001	Printed Compo., 0.1μF + 120Ω
F001	FS1010008	Fuse, 1A (UL)
J011	YL0102003	Terminal
J012	YT0201006	Terminal, Quadradial
L003	LC1154004	Choke Coil, 150μH
L001	LF1120024	Ant. Coil
0710	257816052	Bracket K
0714	281927103	Holder
0806	51100308S	B.H.M. Screw x 2
0807	54050300R	T.L. Washer OR x 2
0808	53110303E	Hexagon Nut x 2
0810	51100310S	B.H.M. Screw x 2
0811	53110303E	Hexagon Nut x 2
R001	GT0522512	Resistor, 2.2MΩ ± 5%, ½W
1133	62031650W	Lug
0903	282715901	Drum
0904	71101569M	Spring
0915	51064019A	Screw x 2
2236	138200503	Clamper x 3
W002	YW2849001	Wire Material
W003	YX2849001	Wire Material
PZ01	YD2891007	P.W. Board
	ZZ2891007	P.W. Board Assembly
MZ01	IN1006302	Lamp
MZ02	IN1006302	Lamp
JZ01	YP1000113	Plug
JZ02	YP1000113	Plug
0521	284930201	Dial
0523	282705302	Cover
0423	281810650	Bearing K
0603	51640412D	Set Screw C.P.
2737	54040402N	Spring Washer
0605	53110403E	Hexagon Nut
0121	275905701	Leg x 4, For U.S.A.
0310	51490410S	B.H.M. Screw F.S. x 4, For U.S.A.
1026	285010502	Chassis

REF. DESIG.	PART NO.	DESCRIPTION
1033	138200503	Clamper x 4
1103	51570408B	P.H. Tapt Screw x 2
1104	54040402N	Spring Washer x 2
1108	51570306B	P.H. Tapt Screw x 6
1113	51570306B	P.H. Tapt Screw x 3
1122	51570306B	P.H. Tapt Screw x 8
1124	51100306S	B.H.M. Screw x 6
1126	51570306B	P.H. Tapt Screw x 7
1127	54050300R	T.L. Washer OR x 2
1131	51570306B	P.H. Tapt Screw
1132	54050300R	T.L. Washer OR
1135	54050300R	T.L. Washer OR
1117	53110303E	Hexagon Nut
2836	51570306B	P.H. Tapt Screw
2837	54050300R	T.L. Washer OR
0112	281815401	Knob x 5
0118	284925701	Lid, For U.S.A.
0119	257711803	Spacer x 3, For U.S.A.
0120	282825702	Lid
0202	284926501	Indicator, For U.S.A.
0203	284926502	Indicator, For CANADA
0207	284926506	Indicator
0211	257886101	Label, UL Caution
0212	257886102	Label, Do Not Remove Cover, For U.S.A.
0213	257886103	Label, See Marking on Bottom, For U.S.A.
0214	250626506	Indicator, Do Not Use as Handle
0219	951091101	Label, LL NO, For CANADA
0220	282186102	Label, Caution, For CANADA
0224	951110103	Label, UL, For U.S.A.
0225	245786104	Label, CSA, For CANADA
3037	951091102	Label, For U.S.A.
0302	51122608E	T.H.M. Screw x 4
0304	51100406S	B.H.M. Screw x 8
0306	51480406S	B.H.M. Screw F x 4, For U.S.A.
0432	285011202	Shaft
0433	284912001	Insulator
3038	288686101	Label
0532	282626901	Protector
0604	54040402N	Spring Washer
0634	51100304S	B.H.M. Screw x 2
0635	56382540G	Eyelet
0613	51100306A	B.H.M. Screw x 2
0614	54050300R	T.L. Washer OR x 2
0824	51100306S	B.H.M. Screw x 2
3137	288506450	Case K, For CANADA
3141	52010420A	H. Head Bolt x 4, For CANADA
3142	54080400R	T.L. Washer RR x 4
1202	284985101	Instructions
1209	284985601	Schematic Diagram
3236	288785108	Instructions
1217	288585107	Instructions
1219	281885104	Instructions
1221	257785450	Guarantee Card K
1302	284980105	Packing Case, For U.S.A.
1303	284980106	Packing Case, For U.S.A.
1305	284980102	Packing Case, For CANADA
1306	284980112	Packing Case, For CANADA
1308	289180301	Partitioner x 2, For U.S.A.
1309	288280303	Partitioner x 2, For CANADA
1312	901383033	Polyethylen Bag, For U.S.A.
1313	901433533	Polyethylen Bag, For CANADA

REF. DESIG.	PART NO.	DESCRIPTION
1314	901302501	Polyethylen Bag x 2
1317	102980401	Sleeve
1319	273182101	Silicagel x 2
1320	281905601	Buffer
1323	952281501	Serial No Card x 4, For U.S.A.
1324	952301512	Serial No Card x 4, For CANADA
1332	ZA0200007	Ext. Antenna
1333	ZD0200010	Connective Cord
1334	ZD0120006	Connective Cord

TECHNICAL SPECIFICATIONS

FM SECTION

Tuning Frequency Range	88 – 108MHz
IHFM Usable Sensitivity	3.0μV
IHFM Selectivity	48dB
Capture Ratio	3dB
Impage Rejection Ratio at 106MHz	50dB
Signal to Noise Ratio (Mono)	65dB
Signal to Noise Ratio (Stereo)	55dB
Total Harmonic Distortion (Mono)	0.5%
Toral Harmonic Distortion (Stereo)	0.8%
Frequency Response (ref. 75μ sec. de-emphasis)	±2dB, 30Hz-15KHz
Stereo Separation at 1KHz	40dB

AM SECTION

Tuning Frequency Range	540-1605KHz
Usable Sensitivity	25μV
Selectivity	20dB
Image Rejection Ratio at 1400KHz	40dB
Signal to Noise Ratio	45dB
Frequency Response, –3dB down	50Hz-3.3KHz
Total Harmonic Distortion	1%

GENERAL

Power Requirements		120V AC 50 to 60Hz
Power Consumption		15 Watts
Dimensions	– Panel Width	14-11/64"–360 mm
	– Panel Height	4-23/32"–120 mm
	– Depth	11-1/32"–280 mm
Weight	– Unit along	12.1lbs–5.5Kg
	– Packed for Shipment	17.6lbs–8Kg

* These specifications and exterior designs may be changed for improvement without advance notice.

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